

transmission of the human immunodeficiency virus (HIV) during donor insemination, the American Fertility Society guidelines for the use of semen-donor inseminations were revised in 1988. It is possible for HIV to be present in fresh donor semen before the donor has become seropositive, a phenomenon that may take three months or longer after infection. Therefore, the use of fresh semen is no longer warranted and only frozen specimens should be used. The frozen specimens are then quarantined for 180 days and the donor retested and found to be seronegative for HIV before the specimen is released for use. Even then the potential for transmission cannot be eliminated.

Lower fecundity rates are reported using frozen semen than with fresh. To achieve the same cumulative pregnancy rates, about twice as many insemination cycles are required to obtain comparable results. This is most likely related to the decreased motility and shorter half-life of cryopreserved sperm than of fresh. Several factors can influence the results of an insemination program using frozen-thawed donor semen. It is not yet clear what number of total motile sperm should be inseminated, but studies have indicated the minimum necessary for acceptable pregnancy rates to be in the range of 20 million. Comparable pregnancy rates to fresh sperm were obtained in one study using 40 million total motile sperm per insemination. The recipient woman's fertility potential also plays an important role, with optimal pregnancy rates occurring when no female infertility factors are present or when a patient's ovulatory dysfunction was corrected with a course of clomiphene citrate. Endometriosis reduces fertility substantially. The route of insemination has traditionally been by the intravaginal or cervical deposition of semen. Controversy exists as to whether improved pregnancy rates might be achieved with intrauterine inseminations. Definitive studies have yet to be completed regarding the efficacy of such a method.

Overall the accepted conception rate per donor insemination cycle is 8% to 10% with a 60% to 70% pregnancy rate by the end of 12 cycles. In addition, no increased risk of miscarriage, ectopic pregnancy, or birth defects has been associated with therapeutic insemination. Couples who fail to attain pregnancy after one year of therapeutic insemination by donor should be counseled on other options including adoption, gamete intrafallopian tube transfer, or in vitro fertilization.

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REFERENCES

- American Fertility Society: New guidelines for the use of semen donor insemination 1986. *Fertil Steril* 1986; 49(Suppl):95S-100S
- Batzner FR, Corson SL: Indications, techniques, success rates, and pregnancy outcome: New directions with donor insemination. *Semin Reprod Endocrinol* 1987; 5:45-57
- Hummel WP, Talbert LM: Current management of a donor insemination program. *Fertil Steril* 1989; 51:919-930

Update on α -Fetoprotein Screening in California

CALIFORNIA LAW REQUIRES that screening for neural tube and certain other birth defects using the maternal serum α -fetoprotein (AFP) level be made available to all pregnant women.

α -Fetoprotein produced by the fetal liver appears in the maternal serum in measurable quantity by the 15th completed week and increases in concentration until term. Maternal serum AFP results are reported as multiples of the median value for a given gestational age and, as such, have

provided a number of insights into conditions affecting a fetus, the pregnancy, or both.

The usefulness of maternal serum AFP screening is improved with accurate pregnancy dating and when raw values are adjusted for race, body weight, and the presence of insulin-dependent diabetes mellitus. Maternal serum AFP levels can be raised or lowered by several conditions affecting fetal AFP production or transplacental or amniotic diffusion. These conditions include multiple gestations, fetal demise, and structural defects such as open spina bifida, gastroschisis, and omphalocele. It is necessary, therefore, to carefully examine the pregnancies of women having abnormal serum AFP values. This begins with expert high-resolution ultrasonography to confirm the gestational age and the presence of a single fetus that is viable and has no structural defect. An abnormal elevation unexplained by ultrasonography should have amniotic fluid collected for AFP determination. If the AFP level is elevated, the acetylcholinesterase level, an enzyme specific for neural tissue, is also assayed.

Using this protocol, about 95% of cases of anencephaly, 80% of cases of open spina bifida, and many ventral wall defects could be detected prenatally.

There is also increasing evidence that a high maternal serum AFP level correlates with an adverse pregnancy outcome defined as fetal death, miscarriage, prematurity, or a congenital anomaly other than those described above.

Because fetuses with Down's syndrome on average produce less AFP, low maternal serum levels can be used to identify another high-risk group of pregnancies: those at risk for Down's syndrome. The combination of maternal age (for women younger than 35 at term) and maternal serum AFP multiples of median values can be used to assign specific risk figures. These women also should be offered amniocentesis. Approximately 20% of fetuses with Down's syndrome are detectable by this method.

In California a comprehensive maternal serum AFP screening program has been in operation since April of 1986. Preliminary data reveal that during the first three completed fiscal years, about 640,000 women participated in the program and 39,000 initially had abnormal results. Many corrections were made regarding gestational age and multiple gestations, thus decreasing the number of abnormal results. There were 23,463 women whose pregnancies were evaluated at contracting prenatal diagnosis centers. Of those pregnancies, 947 had fetal abnormalities, including 457 neural tube defects, 182 ventral wall defects, 83 Down's syndrome, 118 other chromosomal abnormalities, and 107 other birth defects. These numbers are likely to increase because additional reports of abnormalities are being reviewed. These include cases diagnosed after abnormal maternal serum AFP results but evaluated outside of the contracted follow-up system.

The California program shows that coordinated efforts of a state health department, genetics experts, local clinicians, and regional laboratories can result in an effective population-wide screening program.

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REFERENCES

- Lustig L, Clarke S, Cunningham G, et al: California's experience with low MS-AFP results. *Am J Med Genet* 1988; 31:211-222
- Robinson L, Grau P, Crandall BF: Pregnancy outcomes after increasing maternal serum α -fetoprotein levels. *Obstet Gynecol* 1989; 74:17-20
- Wald NJ, Cuckle HS: Recent advances in screening for neural tube defects and Down's syndrome. *Baillieres Clin Obstet Gynaecol* 1987; 1:649-676